

Title (en)

LOW CONTAMINATION HIGH DENSITY PLASMA ETCH CHAMBERS AND METHODS FOR MAKING THE SAME

Title (de)

ÄTZKAMMERN MIT PLASMA HÖHER DICHT E UND GERINGER KONTAMINATION UND HERSTELLUNGS- VERFAHREN DER SELBEN

Title (fr)

CHAMBRE DE GRAVURE AU PLASMA HAUTE DENSITE ET A FAIBLE CONTAMINATION, ET PROCEDES DE FABRICATION CORRESPONDANTS

Publication

EP 1145273 A2 20011017 (EN)

Application

EP 99969835 A 19990924

Priority

- US 9920890 W 19990924
- US 16107498 A 19980925

Abstract (en)

[origin: WO0019481A2] A high density plasma processing chamber including an electrostatic chuck for holding a wafer, and consumable parts that are highly etch resistant, less susceptible to generating contamination and temperature controllable is disclosed. The consumable parts include a chamber liner having a lower support section and a wall that is configured to surround the electrostatic chuck. The consumable parts also include a liner support structure having a lower extension, a flexible wall, and an upper extension. The flexible wall is configured to surround an external surface of the wall of the chamber liner, and the liner support flexible wall is spaced apart from the wall of the chamber liner. The lower extension of the liner support is however, configured to be in direct thermal contact with the lower support section of the chamber liner. Additionally, a baffle ring is part of the consumable parts, and is configured to be assembled with and in thermal contact with the chamber liner and the liner support. A heater is capable of being thermally connected to the liner support for thermal conducting a temperature from the liner support to the chamber liner and the baffle ring. In a most preferred embodiment, the chamber liner and the baffle ring are made from materials that are innocuous to materials on the wafer being etched. In this manner, once these materials are exposed to the energy of the high density plasma sputtering, volatile products will be produced that are substantially similar to volatile etch products produced during the etching of surface layers of the wafer. These volatile products can then be removed from the chamber.

[origin: WO0019481A2] A high density plasma processing chamber (100) including an electrostatic chuck (106) for holding a wafer (104), and consumable parts that are highly etch resistant, less susceptible to generating contamination and temperature controllable is disclosed. The consumable parts include a chamber liner (130) having a lower support section and a wall that is configured to surround the electrostatic chuck. The consumable parts also include a liner support structure having a lower extension, a flexible wall, and an upper extension. The flexible wall is configured to surround an external surface of the wall of the chamber liner, and the liner support flexible wall is spaced apart from the wall of the chamber liner. The lower extension of the liner support is however, configured to be in direct thermal contact with the lower support section of the chamber liner. Additionally, a baffle ring (132) is part of the consumable parts, and is configured to be assembled with and in thermal contact with the chamber liner and the liner support. A heater (140) is capable of being thermally connected to the liner support for thermal conducting a temperature from the liner support to the chamber liner and the baffle ring. In a most preferred embodiment, the chamber liner and the baffle ring are made from materials that are innocuous to materials on the wafer being etched. In this manner, once these materials are exposed to the energy of the high density plasma sputtering, volatile products will be produced that are substantially similar to volatile etch products produced during the etching of surface layers of the wafer. These volatile products can then be removed from the chamber.

IPC 1-7

H01J 37/00

IPC 8 full level

H05H 1/46 (2006.01); **C23C 16/44** (2006.01); **H01J 27/16** (2006.01); **H01J 37/00** (2006.01); **H01J 37/08** (2006.01); **H01J 37/32** (2006.01); **H01J 37/36** (2006.01); **H01L 21/205** (2006.01); **H01L 21/302** (2006.01); **H01L 21/3065** (2006.01)

CPC (source: EP KR US)

H01J 37/321 (2013.01 - EP US); **H01J 37/32477** (2013.01 - EP US); **H01L 21/3065** (2013.01 - KR); **H01J 2237/022** (2013.01 - EP US); **Y10S 156/914** (2013.01 - EP US); **Y10S 156/916** (2013.01 - EP US); **Y10T 428/12347** (2015.01 - EP US)

Cited by

US11387079B2

Designated contracting state (EPC)

DE ES FR GB IE IT

DOCDB simple family (publication)

WO 0019481 A2 20000406; **WO 0019481 A3 20011220**; **WO 0019481 A9 20020131**; AU 1440100 A 20000417; CN 1319247 A 20011024; CN 1328755 C 20070725; DE 69928289 D1 20051215; DE 69928289 T2 20060810; EP 1145273 A2 20011017; EP 1145273 A3 20020327; EP 1145273 B1 20051109; JP 2002533911 A 20021008; JP 4612190 B2 20110112; KR 100566908 B1 20060331; KR 20010075264 A 20010809; RU 2237314 C2 20040927; TW 460972 B 20011021; US 2002102858 A1 20020801; US 6129808 A 20001010; US 6394026 B1 20020528; US 6583064 B2 20030624

DOCDB simple family (application)

US 9920890 W 19990924; AU 1440100 A 19990924; CN 99811286 A 19990924; DE 69928289 T 19990924; EP 99969835 A 19990924; JP 2000572891 A 19990924; KR 20017003624 A 20010321; RU 2001111332 A 19990924; TW 88116512 A 19990927; US 10173702 A 20020321; US 16107498 A 19980925; US 48732500 A 20000119